

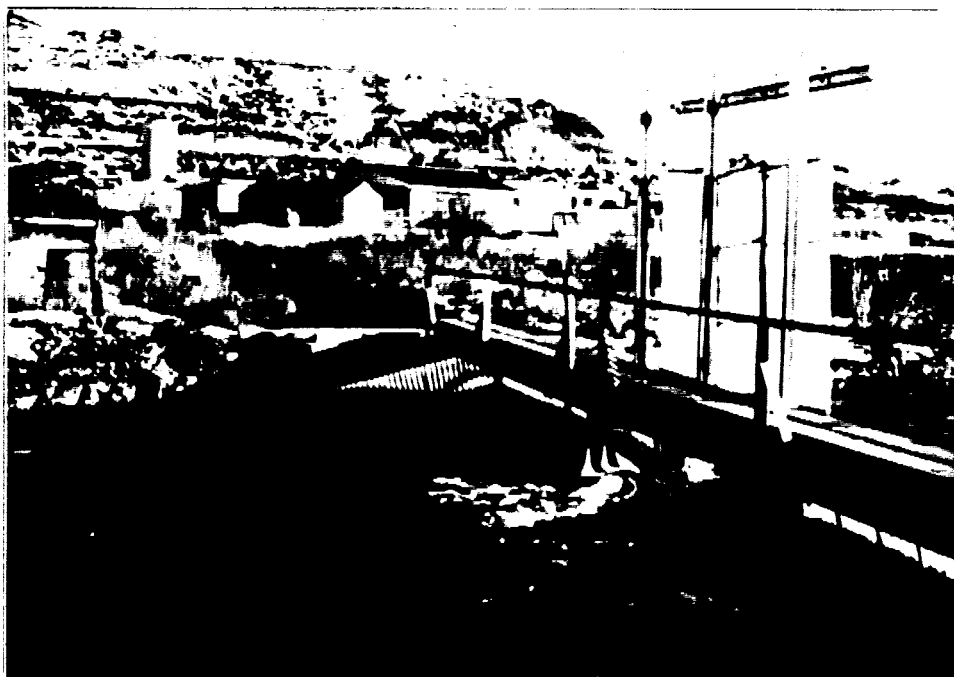


Idaho Power

PAHSIMEROI HATCHERY

1988 Brood Year Report

Spring and Summer Chinook



by

Robert Moore, Fish Hatchery Superintendent II

Julia Hensel, Fish Hatchery Superintendent I

October 1991

TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT	1
INTRODUCTION	2
OBJECTIVES	2
WATER SUPPLY	2
HATCHERY FACILITIES	2
SPRING CHINOOK TRAPPING	3
SUMMER CHINOOK TRAPPING	3
SUMMER CHINOOK SPAWNING INFORMATION	3
CARCASS DISPOSITION	3
SPAWNING TECHNIQUES	10
SOUTH FORK SUMMER CHINOOK EGGS	10
FISH PRODUCTION	10
FISH HEALTH	10
HATCHERY IMPROVEMENTS	12
STAFFING	12
ACKNOWLEDGEMENTS	13

LIST OF TABLES

Table 1.	Chinook salmon length frequency, 1988	5
Table 2.	Brood year 1988 summer chinook production costs	11

LIST OF FIGURES

	<u>Page</u>
Figure 1. Run timing of all chinook salmon returning to Pahsimeroi Hatchery, 1988	4
Figure 2. Length frequency distribution of all chinook salmon returning to Pahsimeroi Hatchery, 1988	6
Figure 3. Length frequency distribution of spring chinook males	7
Figure 4. Length frequency distribution of spring chinook females	7
Figure 5. Length frequency distribution of summer chinook males	8
Figure 6. Length frequency distribution of summer chinook females	8
Figure 7. Age class distribution of spring and summer chinook	9

CONTENTS

ABSTRACT

Chinook salmon trapping began on May 14 and concluded on October 11, 1988. A total of 401 spring chinook (176 males and 225 females) and 838 summer chinook (378 males, 395 females and 75 jacks) were trapped during 1988. A temporary weir was installed on the Yankee Fork above Custer, and 392 spring chinook were stocked for a Shoshone-Bannock tribal fishery. All spring chinook were hauled for tribal fishery and were not injected with erythromycin phosphate. Prehauling mortality was only 2.2%. The summer chinook were injected, and their prespawning mortality was 14% due to low oxygen and renal failure.

A total of 164 summer chinook females were spawned for 1,053,536 green eggs. Fecundity averaged 6,424 eggs/female, and an eye-up of 90.9% was achieved. An additional 317,272 eyed summer chinook eggs were received from McCall Hatchery.

Brood year 1988 smolts were released during March of 1990. Pahsimeroi stock smolts in pond 1 totaled 531,252 (17.2/lb; 30,877 lbs), while Pahsimeroi/South Fork smolts totaled 576,748 (16.6/lb; 31,732 lbs).

Authors:

Robert Moore
Fish Hatchery Superintendent II

Julia Rensel
Fish Hatchery Superintendent I

INTRODUCTION

Pahsimeroi Hatchery is owned and funded by Idaho Power Company (IPC) and is operated by the Idaho Department of Fish and Game (IDFG). The salmon and steelhead programs are mitigation for the IPC dams constructed on the Snake River in Hells Canyon. The hatchery is located near Ellis, Idaho, one mile upstream on the Pahsimeroi River, with the final chinook rearing ponds located at a separate facility seven miles upstream on the Pahsimeroi River.

OBJECTIVES

The objectives of the Pahsimeroi Hatchery are as follows:

1. To rear one million summer chinook smolts for release into the Pahsimeroi River.
2. To trap and spawn summer chinook adults returning to the Pahsimeroi River.

WATER SUPPLY

Water for the hatchery is supplied by the Pahsimeroi River, and varies in temperature from 32°F during the winter to 67°F in summer. The river water has a high organic load during winter, but is quite clean during the summer months. In addition, the hatchery has spring water available for its egg incubation system. Its temperature varies from 52°F in the winter to 55°F in the summer and has a pH of 7.8.

HATCHERY FACILITIES

Located on the hatchery is a fish trap constructed of three concrete pens measuring 15 ft x 75 ft x 4.5 ft deep. Adult fish are held in these pens until they are spawned. The trap has a series of ladders in the structure and a metal grate that keeps the fish from returning to the river. A 55-ft long weir crosses the Pahsimeroi River to guide the arriving fish into the trap facility.

Near the trap facility lies a residence, two pump houses, a 10,000-gallon water storage tank, a metal shop building, a cinder block office building, a public restroom, an incubator room with capacity for 20 double stacks of Heath incubators, and a building with a two-bedroom dormitory and workshop. Four concrete raceways (4 ft x 100 ft) are used for early rearing of salmon and steelhead fry.

SABYRE88

Two dirt rearing ponds (40 ft x 300 ft) are located seven miles above the trap at a separate facility. These are used to rear summer chinook smolts. Facilities at the upper site include a residence, a small storage building, a feed bin for storing dry fish feed, and a walk-in freezer for storing frozen salmon feed.

SPRING CHINOOK TRAPPING

Spring chinook trapping began on May 14 and concluded on June 24, 1988 (Figure 1). The run consisted of 176 males and 225 females. Length frequencies were taken on all adult fish (Table 1; Figures 2, 3, and 4), and it was determined that there were 185 four-year-olds and 216 five-year-olds. Mortality amounted to seven females and two males, or 2.2% of the run.

A metal weir was installed on the Yankee Fork below the town of Custer to prevent salmon from moving downstream. A total of 174 males and 218 females were planted in June and July from 5-mile to 11-mile creeks. Members of the Shoshone-Bannock Indian tribes then conducted a traditional-style fishery in this area.

SUMMER CHINOOK TRAPPING

Trapping for summer chinook started on June 24 and ended on October 11, 1988. The run consisted of 763 adults and 75 jacks, for a total of 838 fish. Length frequencies were taken on all adults (Figures 5, 6, and 7). The summer chinook run was made up of 47 four-year-olds and 716 five-year-olds. Pre-spawning mortality amounted to 101 females and 16 males, or 14% of the run. Mortalities appeared to be from low oxygen and renal failure. A total of 112 males, 115 females, and 33 jacks (31% of the run) were released to spawn naturally in the Pahsimeroi River. Age breakdown was as follows: jacks - 64 cm or less; four-year-olds - 65 cm through 83 cm; and five-year-olds - 84 cm or greater.

SUMMER CHINOOK SPAWNING INFORMATION

Summer chinook spawning began on September 2 and concluded on October 7, 1988. A total of 164 females were spawned for 1,053,536 green eggs. Fecundity averaged 6,424 eggs/female, and the average eye-up was 90.9%.

CARCASS DISPOSITION

Ponded fish were injected with erythromycin and treated externally with malachite green because of the warm low water this summer. Since the fish were treated, the carcasses had to be hauled to the landfill to be buried.

SABYRE88

RUN TIMING: CHINOOK SALMON 1988

PAHSIMEROI HATCHERY

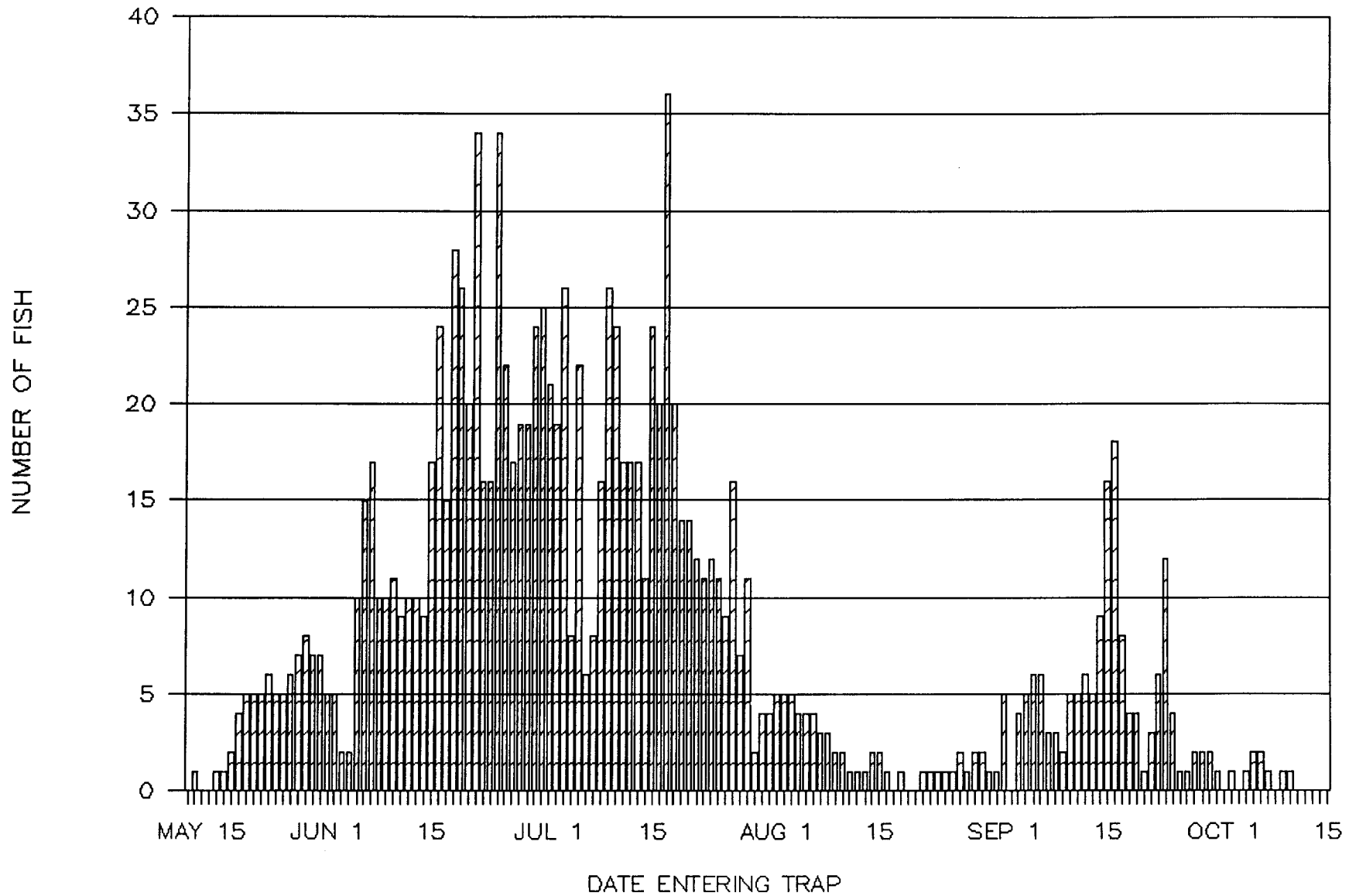


Figure 1. Run timing of all chinook salmon returning to Pahsimeroi Hatchery, 1988.

Table 1. Chinook salmon length frequency, 1988.

(cm)	Spring		Summer		(cm)	Summer Jacks
	Males	Females	Males	Females		
63	0	0	0	0	40	1
64	2	0	0	0	41	0
65	0	0	0	1	42	0
66	1	2	0	0	43	0
67	0	1	0	0	44	1
68	1	0	0	0	45	0
69	1	2	1	1	46	1
70	0	2	4	0	47	0
71	3	3	1	0	48	8
72	1	6	1	1	49	5
73	2	4	0	0	50	5
74	2	4	1	0	51	7
75	9	12	0	2	52	6
76	8	9	0	2	53	13
77	8	10	3	0	54	8
78	4	9	4	1	55	1
79	3	8	2	1	56	2
80	5	7	1	4	57	2
81	4	13	3	1	58	4
82	10	12	1	7	59	1
83	9	8	0	4	60	1
84	10	15	2	4	61	5
85	6	10	3	18	62	0
86	11	11	4	9	63	1
87	9	7	5	26	64	3
88	10	11	13	26	75	
89	8	10	9	29		
90	5	10	10	39		
91	2	8	16	39	Year class breakdown	
92	4	5	22	35		
93	5	10	28	43		
94	6	7	28	28	Sprints Summers	
95	9	2	30	29		
96	3	4	27	11		
97	2	2	19	13	3-Y	0
98	3	1	28	3	4-Y	73
99	4	0	16	3		
100	2	0	19	3	4-Y	112
101	0	0	15	2		
102	2	0	13	0	5-Y	103
103	1	0	14	0		
104	0	0	5	0	5-Y	113
105	1	0	12	0		
106	0	0	12	0	Total	401
107	0	0	4	0		
108	0	0	1	0		
109	0	0	0	0	Adult	763
110	0	0	1	0		
Total	176	225	378	385		

Jacks = 64 cm or less, 4-year-olds = 65-83 cm, five-year-olds = 84 cm or greater.

SABYRE88

LENGTH FREQUENCY: CHINOOK SALMON 1988

PAHSIMEROI HATCHERY

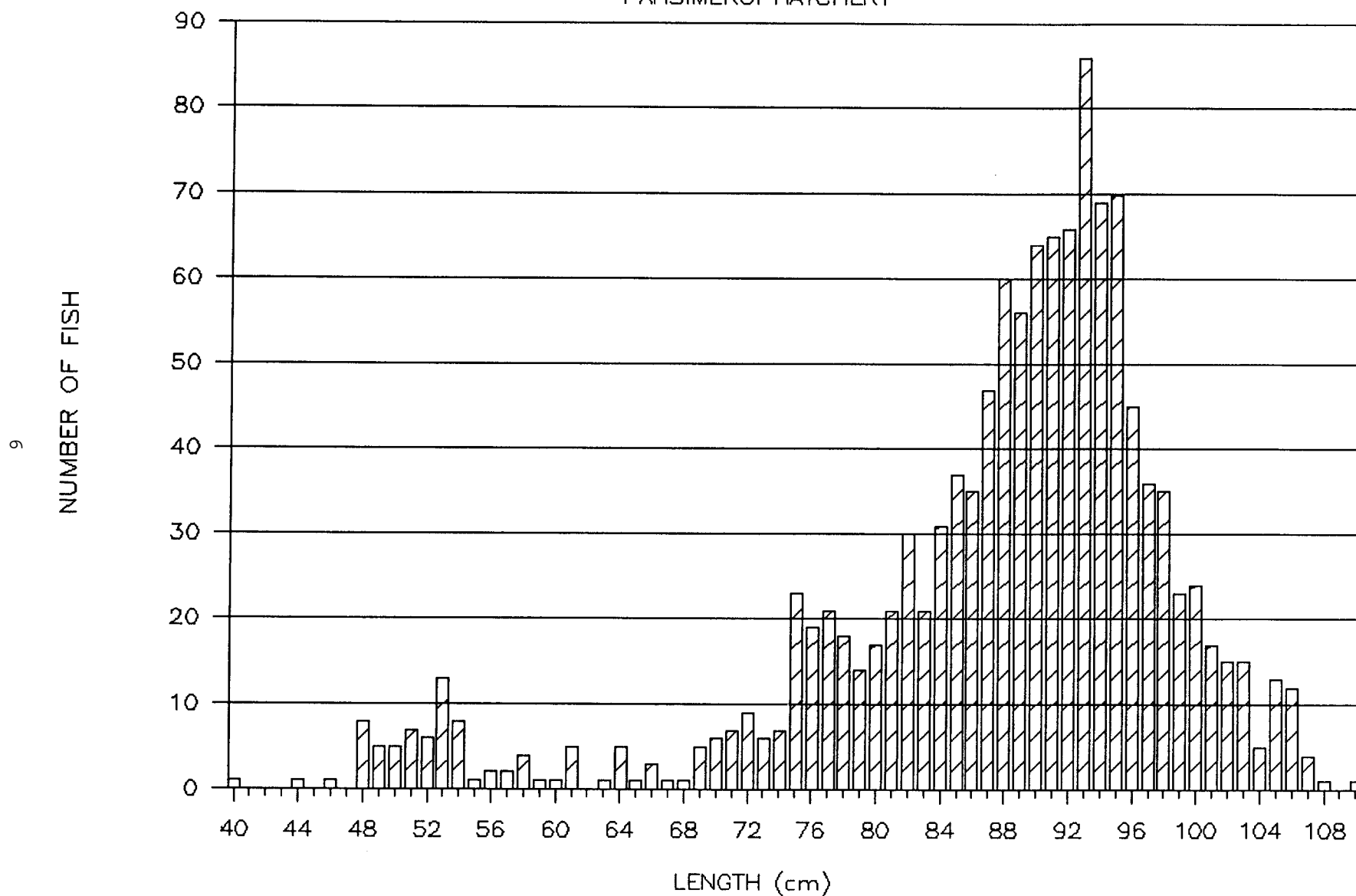


Figure 2. Length frequency distribution of all chinook salmon returning to Pahsimeroi Hatchery, 1988.

Figure 3. Length frequency distribution of spring chinook males.

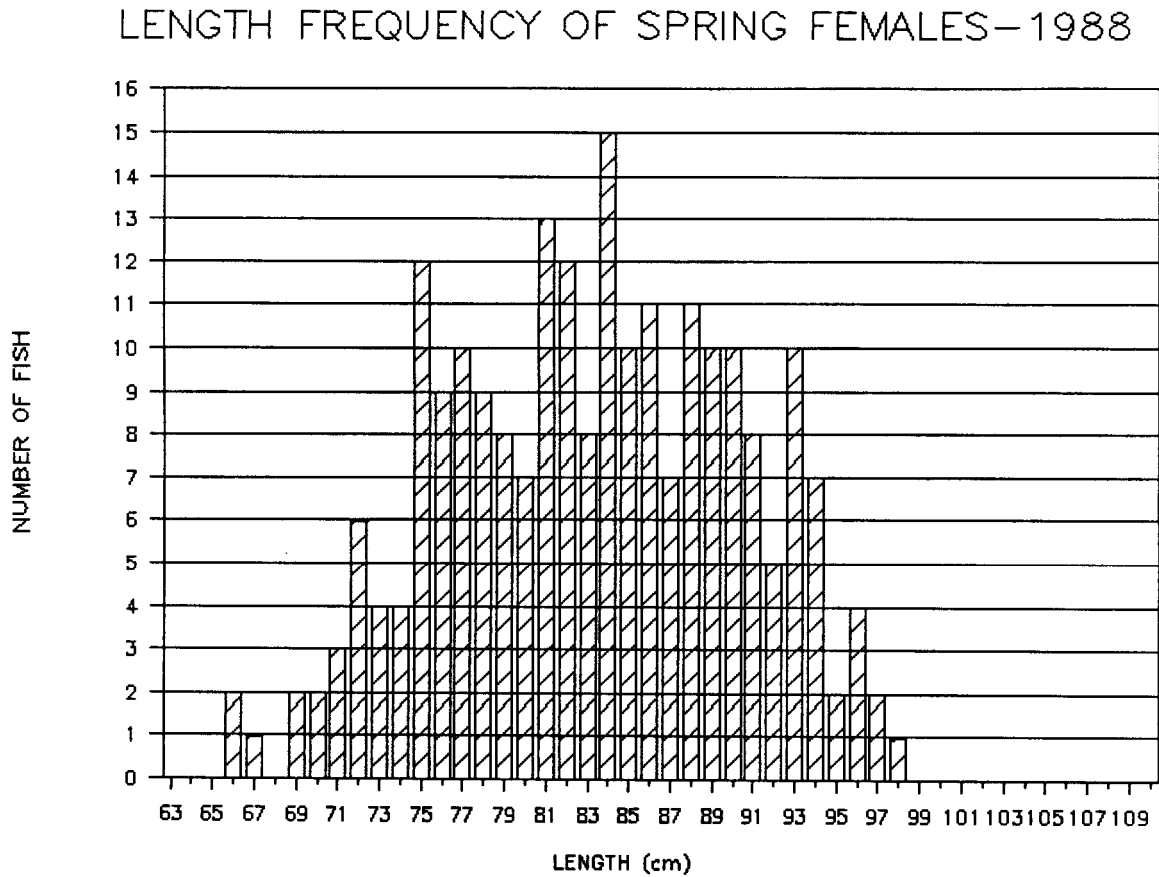


Figure 4. Length frequency distribution of spring chinook females.

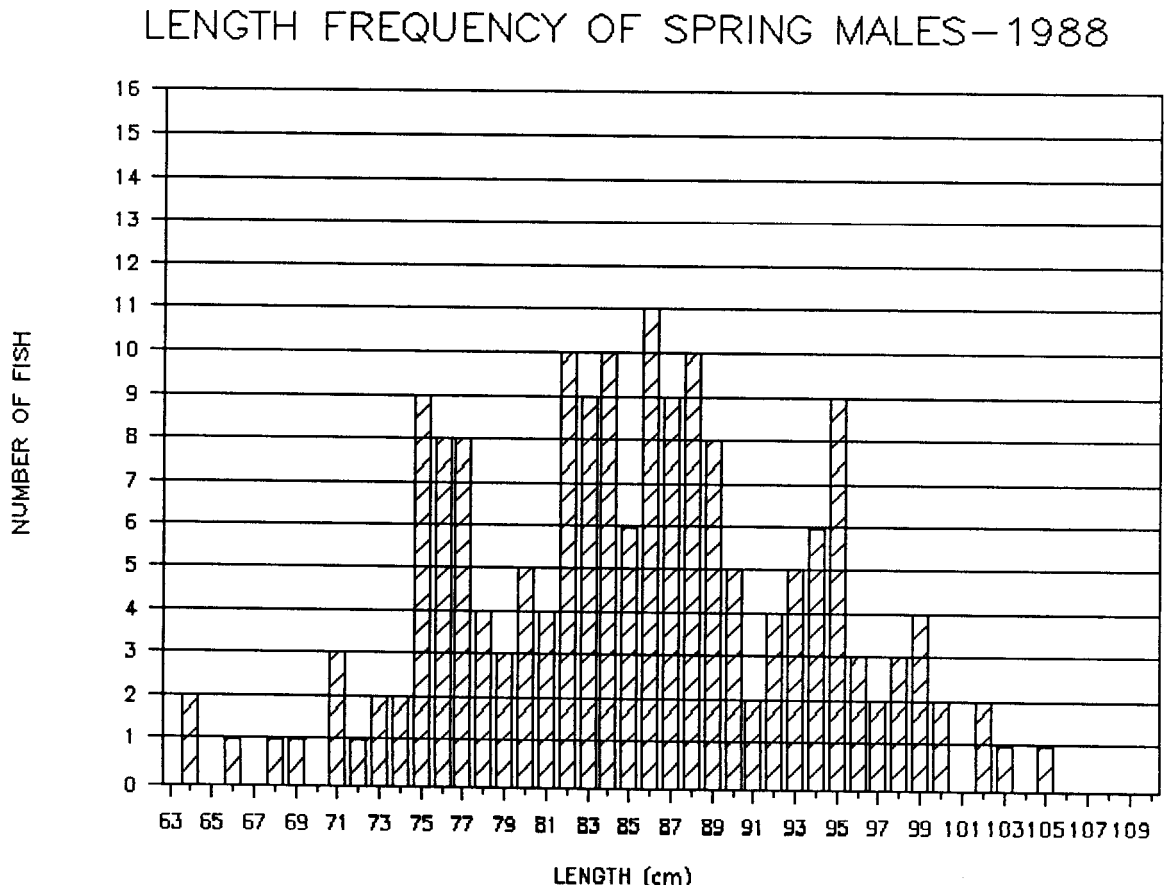


Figure 5. Length frequency distribution of summer chinook males.

LENGTH FREQUENCY OF SUMMER MALES-1988

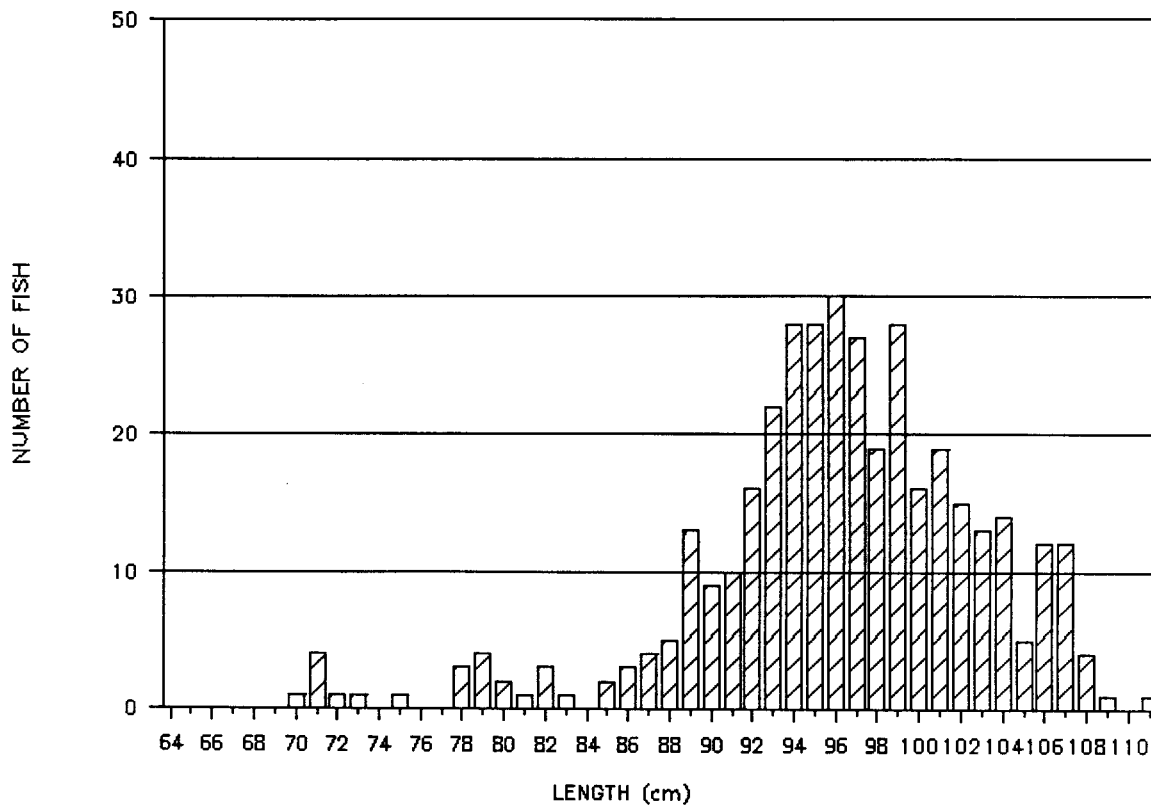


Figure 6. Length frequency distribution of summer chinook females.

LENGTH FREQUENCY OF SUMMER FEMALES-1988

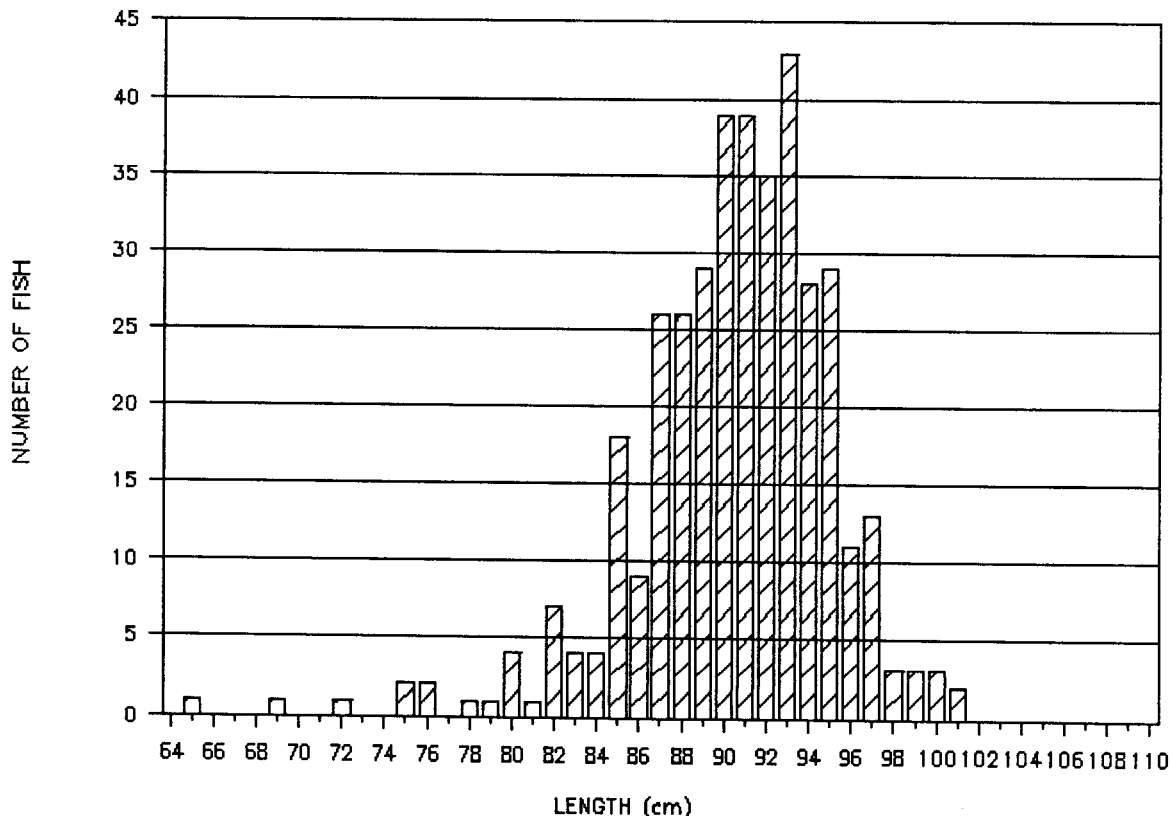
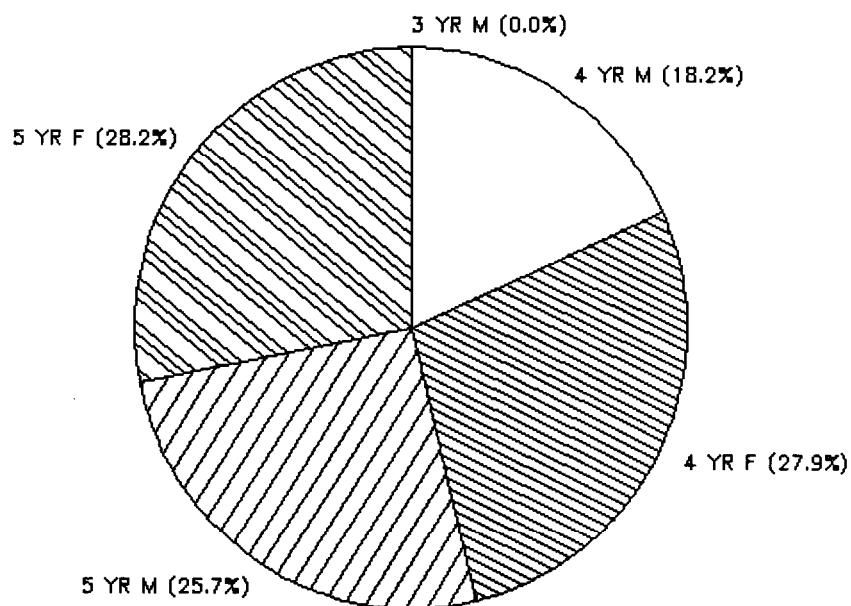
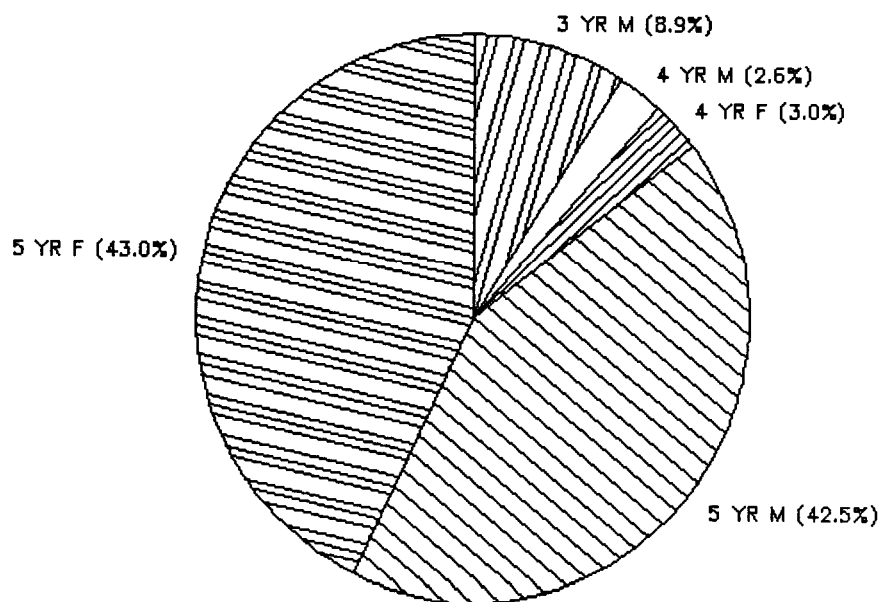


Figure 7. Age class distribution of spring and summer chinook.
AGE CLASS OF SPRING CHINOOK 1988



AGE CLASS OF SUMMER CHINOOK 1988



SPAWNING TECHNIQUES

Females were sorted twice a week for ripeness. Ripe fish were killed by a blow to the head and bled by severing the caudal artery. Salmon were spawned at a ratio of one female to one male. The eggs were hand-stirred and allowed to sit for five minutes. The eggs were then loaded into the incubator trays with one female per tray. Each tray, containing a 100-ppm iodine solution (Argentyne), was then allowed to sit for one-half hour before being put back into the water flow of the incubator stack.

Daily treatments of 1,667-ppm formalin were used to reduce fungus build-up. Dead eggs were picked and counted using the displacement method. The dead egg numbers were taken from the initial green egg numbers to get the percent eye-up. After the eggs were eyed and picked, the incubator system was switched from spring water to the cooler river water to retard fry development.

SOUTH FORK SUMMER CHINOOK EGGS

South Fork Salmon River summer chinook eggs were received from McCall Hatchery in October. The total eyed eggs received was 317,272. This amounted to 377,672 green eggs taken at spawning time for an eye-up of 84 percent. These eggs were used to help rebuild the Pahsimeroi summer chinook run.

FISH PRODUCTION

Transfer of salmon fry into the raceways began during mid-December and continued through February. Initially, these fish were hand-fed at a rate of 3% of body weight and reduced to 2% after ponding. All lots of fish were transported to the upper ponds in April. Pond one contained 618,443 Pahsimeroi stock and pond two contained 620,872 mixed Pahsimeroi and South Fork stock. All fish were fed Oregon Moist pellets. The total conversion for pond 1 was 1.44, while pond 2 was 1.48. A total of 1,058,000 fish were released during the week of March 15-23, 1990. Pahsimeroi stock released from pond 1 consisted of 531,252 fish at 17.2/lb (30,887 lbs). The South Fork/Pahsimeroi stock released from pond 2 consisted of 576,748 fish at 16.6/lb (31,732 lbs). Production costs are summarized in Table 2.

FISH HEALTH

Whirling disease was again diagnosed in these fish. Both groups were affected. Blackened tails, the first sign of the disease, appeared in early June with the whirling appearing shortly thereafter. Whirling was most evident when the fish were "spooked", such as walking out on the feeder ramps.

SABYRE88

Table 2. Brood year 1988 summer chinook production costs.

<u>Lbs of fish</u> <u>produced</u>	<u>Lbs of</u> <u>feed fed</u>	<u>Feed</u> <u>cost</u>	<u>Conversion</u>	<u>Cost per lb</u> <u>produced</u>
62,619 (1,058,000 fish)	89,500	\$ 39,960	1.46 avg	\$.6381
Feed costs	\$ 39,960			
Personnel costs	53,592			
Operating costs	27,987			
Capital outlay	<u>11,592</u>			
Program total*	\$134,131			
Total program cost per pound of fish produced = \$ 2.14				
Total program cost per fish produced = \$.1268				
<u>*Costs estimated for an entire 18-month rearing cycle of one brood year only.</u>				

HATCHERY IMPROVEMENTS

Many new improvements have been made at the hatchery this year. The office was expanded and remodeled, panelled, carpeted, and baseboard heating was installed. New cupboards were constructed and installed in the incubator room and upper residence. Shelving was put in the garages for storage. The sink and ice maker were moved and installed in the incubator room. New appliances were purchased and moved into the dormitory. These included: a refrigerator, microwave, washer and dryer, and a color television.

A new ramp was dug to make it easier for the fish trucks to unload their smolts into the river. Baffles were made and installed into raceway one. Improvements to the ponds include new inlet structures and electric drum screens at the inlets, three new electric feeders for pond one, and conduit run for all electrical lines to the feeders.

Many safety improvements have been made this year. All electrical wiring on the hatchery has been brought up to safety code, grills have been placed in front of all culverts, and walkway platforms have been placed over all keyways at the ponds.

STAFFING

The hatchery is staffed with two permanent employees; a Hatchery Superintendent II and a Hatchery Superintendent I. Several temporaries are employed at various times of the year to help with the spawning of steelhead and salmon.

ACKNOWLEDGEMENTS

The crew at Pahsimeroi Hatchery would like to express their appreciation to all those who helped with the spawning of the salmon. We would also like to thank Paul Abbott and the staff of Idaho Power Company for their continued help and support.

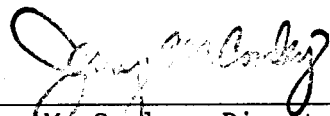
Submitted by:

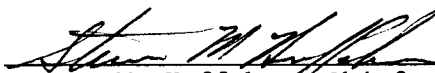
Robert Moore
Fish Hatchery Superintendent II

Julia Rensel
Fish Hatchery Superintendent I

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME



Jerry M. Conley, Director

Steven M. Huffaker, Chief
Bureau of Fisheries

Bill Hutchinson
Hatcheries Manager